भारतीय मानक
Indian Standard

IS 17650 (Part 2) : 2021

जलकुशल नल-साजी उत्पाद — अपेक्षाएँ

भाग 2 सैनिटरी फिटिंग

Water Efficient Plumbing Products — Requirements

Part 2 Sanitary Fittings

ICS 91.140.70

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Sanitary Appliances and Water Fittings Sectional Committee, CED 03

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Sanitary Appliances and Water Fittings Sectional Committee had been approved by the Civil Engineering Divisional Council.

Various sanitary appliances and fittings are used in plumbing system in buildings of various occupancy types, such as residential, educational, institutional, mercantile assembly and industrial. Plumbing systems used in the country are mainly based on water carriage system. Water is used as media for sanitizing and operation in sanitaryware and sanitary fittings. Due to increase in urbanization and increased use of various plumbing products within buildings, per capita water consumption has increased. This lead to the concern of water shortage and need for water conservation for the future generation in the country, and is a global concern too. Further, this increase in demand of water resulted in additional pressure on water supply systems and also additional water sources are required to meet this additional demand of water. This enhanced use of water may cause generation of more sewage, requiring more infrastructure for sewage transportation and treatment of the sewage. Considering this, it is felt that various fixtures used in plumbing system should be water efficient to reduce water demand while ensuring effective operation and maintenance of these appliances in the system.

This standard has, therefore, been formulated to lay down additional requirements for sanitary fittings for their performance as water efficient plumbing products. It also covers the criteria for water efficiency rating and labelling of such products based on their flow rate. As per the standard, the product can be rated as either one star, two stars or three stars; higher the number of stars, the better would be the water efficiency rating of the products. Metered faucets shall be used on lavatory basin (wash basin in public toilets). Volume of water in these faucets is pre-set per usages/cycles. The other faucets (continuous flow) are generally used in residential installations where flow rates are defined as litres per minute.

A series of Indian standards have been formulated for various sanitary appliances and fittings. This standard (Part 2) is formulated to provide additional requirements for assessment and rating of sanitary fittings based on their water efficiency. The Part 1 of the standard covers such additional requirements for assessment and rating of sanitaryware.

The composition of the Committee responsible for the formulation of this standard is given in Annex A.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 ‘Rules for rounding off numerical values (*revised*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

WATER EFFICIENT PLUMBING PRODUCTS — REQUIREMENTS

PART 2 SANITARY FITTINGS

1 SCOPE

1.1 This standard (Part 2) covers requirements for assessment and water efficiency rating of sanitary fittings, such as faucets (taps) and showerheads for their performance based on water efficiency, which are in addition to the requirements specified in relevant Indian Standards as applicable.

NOTE — The terms taps and faucets have been used synonymously.

1.2 This standard applies to the following products:

a) Faucets (Lavatory faucets and sink faucets); and
b) Showerheads (hand held showers, overhead showers and hand held ablution spray).

1.3 This standard is an adjunct to the concerned Indian Standards on taps and showers, with respect to additional requirements for water efficiency.

1.4 Certain minimal pressure is required for the functional aspects of these water efficiency rated products which would need to be verified from the manufacturer, however, this standard states the respective flow rates under various water efficient ratings as its maximum flow for the maximum pressure of 0.42 MPa.

2 REFERENCES

The Indian Standards given below contain provisions, which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreement based on this standard are encouraged to investigate the possibility of applying the most recent edition of the standards given below:

IS No.	*Title*
8931 : 2021	Copper alloy single taps, stop valves, combination tap assembly and single lever mixer for water services — Specification (*second revision*)

3 TERMINOLOGY

For the purpose of this standard, the terms and definitions as given in IS 8931.

4 REQUIREMENTS FOR WATER EFFICIENT SANITARY FITTINGS

4.1 General Requirement

The water efficient plumbing products shall conform to IS 8931 or Indian Standard specification for showerheads, as applicable.

4.2 Performance Test (Flow Rate Test)

4.2.1 *Principle*

The test is performed to determine the flow rate of sanitary fittings corresponding to reference pressure. The measurement is carried out with fittings fully open.

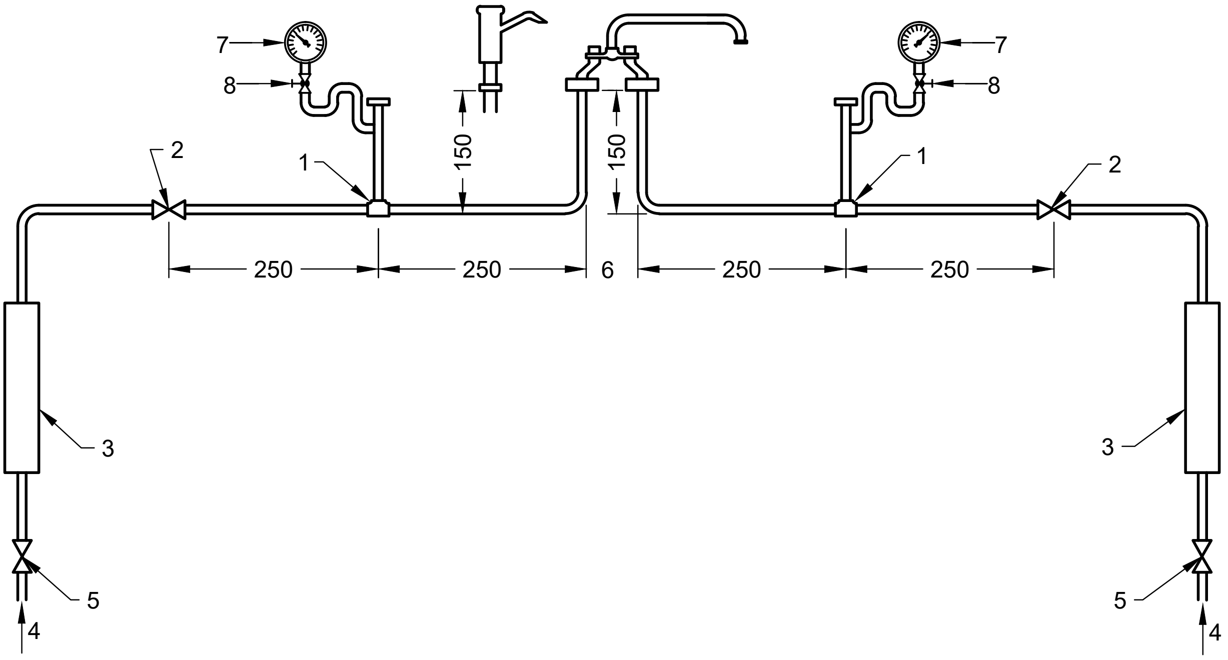
4.2.2 *Test Equipment*

The hydraulic test circuit shall be capable of producing the static and dynamic pressure required and maintaining them for the entire duration of the test (*see* Fig. 1).

4.2.3 *Procedure for Determining the Flow Rate of Sanitary Fittings*

a) Connect the faucet/shower/mixer specimen to the test circuit.
b) With the outlet orifice closed and generally turned downward, open the seal.
c) Take three measurements of flow rate at three different pressures of 0.1 MPa, 0.3 MPa and 0.5 MPa, and calculate average flow rate at each pressure. Apply the pressure to the fitting for a duration of (60 ± 5) s.
d) Using logarithmic coordinates, plot the curve of the flow rate (Q) as a function of the pressure (P).
e) Determine on this curve the value of the flow rate corresponding to the pressure of 0.42 MPa.

4.2.3.1 The flow rate determined at 0.42 MPa shall be considered for water efficiency rating as per Table 1. For non-metered fittings, the average maximum difference between the highest and the lowest average flow rate shall not exceed 2.0 litres/min.



KEY:

1 PRESSURE TAKE - OFF TEE
2 CONTROL VALVE
3 FLOW METER
4 COLD WATER SUPPLY
5 STOP VALVE
6 CENTERS TO SUIT TAP ASSEMBLIES
7 PRESSURE GAUGE (0.01 N/mm^2)
8 GAUGE COCK

All dimensions in millimetres.

FIG. 1 TEST EQUIPMENT FOR FLOW RATE TEST

Table 1 Water Efficiency Rating Criteria for Sanitary Fitting

(*Clauses* 4.2.3.1 *and* 6.1)

Sl No.	Water Consumption Per Unit	Water Consumption Per Unit	Water Efficiency Rating Criteria		
			1 Star	2 Stars	3 Stars
(1)	(2)	(3)	(4)	(5)	(6)
i)	Metered faucets for basin use	litres/use	Not more than 1.0	Not more than 0.8	Not more than 0.6
ii)	Wash basin/lavatory faucet (also applies to sensor faucets)	litres/min	Not more than 8.0	Not more than 6.0	Not more than 3.0
iii)	Sink faucet	litres/min	Not more than 8.0	Not more than 6.0	Not more than 4.5
iv)	Overhead shower	litres/min	Not more than 10.0	Not more than 8.0	Not more than 6.8
v)	Hand held shower	litres/min	Not more than 8.0	Not more than 6.0	Not more than 4.0
vi)	Hand held ablution spray	litres/min	Not more than 6.0	Not more than 5.0	Not more than 4.0

5 SAMPLING AND CRITERIA FOR CONFORMITY

The scale of sampling and criteria for conformity shall be as given in the respective product standard for the flow rate test. The samples shall be taken from the lot presented for test for checking compliance to the product standard.

6 REQUIREMENTS FOR WATER EFFICIENCY RATING

6.1 The water efficiency rating of faucet and showerhead shall be determined and the product shall be rated and labelled in accordance with Table 1 based on their flow rates.

6.2 In case of a multi mode fixture, all the modes shall be tested for water efficiency rating and the product shall be assigned the rating corresponding to the lowest rating for a mode achieved. In case any of the mode is not water efficient, the product shall be considered as a non water efficient product.

7 MARKING

7.1 Each piece of fitting shall be clearly and indelibly marked at a suitable place with the following, and other information as contained in relevant Indian Standard:

a) Name or trade-mark of the manufacturer,
b) Batch/lot number, and
c) Water efficiency rating label as per **7.1.1**.

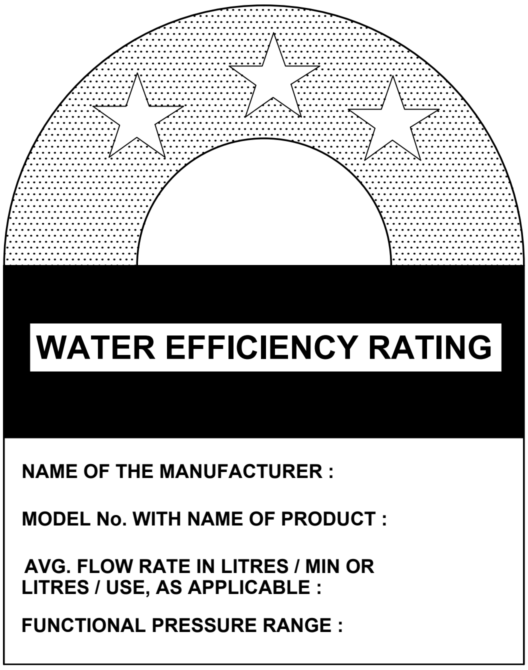
7.1.1 *Water Efficiency Rating Label*

Each appliance/fitting which complies under the water consumption for rating criteria as per Table 1 shall be pasted with water proof sticker having water rating label for the product. The carton containing the product shall also be pasted with a sticker as above. The sticker shall have water efficiency rating label (*see* Fig. 2) containing the following information:

a) Name and/or trade mark of the manufacturer;
b) Model number with name of the product;
c) Pressure range for functional requirements;
d) Average flow rate in litres/min or litres/use, as applicable; and
e) Water efficiency rating for water efficient product, that is 1 star or 2 stars or 3 stars.

7.1.2 Caution should be provided by the manufacturer of having provided aerator/flow restricting devices in the water efficient sanitary fitting and that the customer should not tamper with the same. Any change or tampering with the aerator/flow restricting device will alter the water efficiency rating of the product. Above caution should be provided in the instruction manual provided with the product.

7.2 The label shall be reproduced in full. The label shall be faithfully reproduced, and all text shall be readable with normal or corrected vision. The label shall be prominent and visible when the product is profiled, displayed, promoted, marketed, sold or supplied at any point in the supply chain.


WATER EFFICIENCY RATING
NAME OF THE MANUFACTURER :
MODEL No. WITH NAME OF PRODUCT :
AVG. FLOW RATE IN LITRES / MIN OR LITRES / USE, AS APPLICABLE :
FUNCTIONAL PRESSURE RANGE :

NOTE — The art work of the label is only typical in nature.

Fig. 2 Label for Water Efficiency Rating of Sanitary Fitting

ANNEX A

(*Foreword*)

COMMITTEE COMPOSITION

Sanitary Appliances and Water Fittings Sectional Committee, CED 03

Organization	*Representative(s)*
Municipal Corporation of Greater Mumbai, Mumbai	Hydraulic Engineer (Shri A. S. Rathore) (***Chairman***)
Brihan Mumbai Licensed Plumbers' Association, Mumbai	Shri Kishor V. Merchant Shri Bijal M. Shah (*Alternate*)
Building Materials and Technology Promotion Council, New Delhi	Shri S. K. Gupta Shri C. N. Jha (*Alternate*)
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Delhi Jal Board, New Delhi	Chief Engineer (WW) II Superintending Engineer (NW) (*Alternate*)
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Municipal Corporation of Greater Mumbai, Mumbai	Dy Hydraulic Engineer Executive Engineer (Planning) (*Alternate*)

Organization	*Representative(s)*
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Research Designs and Standards Organization, Lucknow	Representative
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Tata Consulting Engineers Ltd, Mumbai	Representative
Voluntary Organization in Interest of Consumers Education, New Delhi	Shri Hemant Kumar
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Member Secretary

Shrimati Madhurima Madhav
Scientist D (Civil Engineering), BIS

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CSIR-Central Building Research Institute, Roorkee	Shri Ajay Singh Shri S. K. Gupta (*Alternate*)
Delhi Jal Board, Delhi	Chief Engineer (WW) II Superintending Engineer (NW) (*Alternate*)

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Tamil Nadu Water Supply and Drainage Board, Chennai	Joint Chief Engneer (PDC) Dy Chief Engineer (O & M) (*Alternate*)

Panel for Formulation of Standards for Requirements for Water Efficient Plumbing Products, CED 3 : P1

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Brihan Mumbai Licensed Plumbers' Association, Mumbai	Shri Kishore V. Merchant Shri B. M. Shah (*Alternate*)
Central Public Health and Environmental Engineering Organization, New Delhi	Representative
Centre for Science and Environment, New Delhi	Dr Suresh Kumar Rohilla
Cera Sanitaryware Limited, Ahmedabad	Shri Bhushan Yerpude Shri Bhavik Patel (*Alternate*)
Delhi Jal Board, New Delhi	Shri Ajay Kumar Gupta
Fluid Control Research Institute, Palakkad	Shri Gopan C. K.
Gem Sanitary Appliances Pvt Ltd, New Delhi	Shri B. K. Singhal

Organization	*Representative(s)*
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Indian Green Building Council, Hyderabad	Shri S. Karthiyeyan Shri Punit Agarwal (*Alternate*)
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